

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A system comprising:
 - a lithium battery having an internal resistance;
 - a charge storage capacitor electrically connected to the lithium battery;
 - a first device electrically connected to ~~said~~ the lithium battery and adapted to be powered by ~~said~~ the battery; and
 - at least one second device electrically connected to said charge storage capacitor,wherein the at least one second device is adapted to perform a charge time measurement,
the at least one second device being adapted to:
 - access a predetermined set of charge time measurement set-up parameters and a predetermined elective replacement time (ERT) charge time limit determined from a battery resistance ERT target that corresponds to a battery charge depletion target wherein the predetermined set of charge time measurement set-up parameters include:
 - an initial reference voltage (VI) to begin the time measurement for determining the rate of charge storage in the capacitor, VI being larger than a discharge voltage for the capacitor (Vd); and
 - a physician-programmed final voltage (VF) to end a time measurement for determining the rate of charge storage in the capacitor;
 - determine a rate of charge storage in the capacitor ~~using the predetermined set of charge time measurement set-up parameters~~ when the capacitor is charged from VI to VF;
 - compare the determined rate of charge storage in the capacitor to the predetermined ERT charge time limit for the predetermined set of charge time measurement set-up parameters; and

declare an ERT based on a number of comparisons between the determined rate of charge storage in the capacitor and the ERT charge time limit.

2. (Canceled)

3. (Original) The system of claim 1, wherein the first device has a plurality of relatively quiescent periods and the storage capacitor is adapted to provide a basis of determining the rate of charge storage during one of the relatively quiescent periods.

4. (Currently Amended) The system of claim 1, ~~wherein the predetermined set of charge time measurement set-up parameters include:~~

~~—— a physician programmed final voltage (VF) to end a time measurement for determining the rate of charge storage in the capacitor; and~~

~~—— an initial reference voltage (VI) to begin the time measurement for determining the rate of charge storage in the capacitor;~~

wherein the at least one second device is adapted to increase a capacitor voltage level (V_{CS}) across the storage capacitor ~~a pacing supply storage voltage (V_{CS}) increases~~ approximately linearly from VI to VF during the time measurement for determining the rate of charge storage in the capacitor.

5. (Currently Amended) The system of claim 1 ~~claim 4~~, wherein:

the at least one second device includes a multiplexer for selecting one of VF and VI to be compared to a the capacitor voltage level (V_{CS}) for controlling current flow from ~~the battery~~ a power terminal of the battery to the capacitor; and

the at least one second device selects VI to be compared to ~~V_{se}~~ V_{CS} to begin a the time charge measurement ~~count~~ and VF to be compared to ~~V_{se}~~ V_{CS} to end the time charge measurement ~~count~~.

6. (Original) The system of claim 1, wherein the at least one second device is adapted to declare an ERT if N previous measurements are greater than the ERT charge time limit.
7. (Currently Amended) The system of claim 1, wherein a the first device includes a table with a plurality of device operating current range ~~is subdivided into current range~~ bins, each bin having a ~~battery charge depletion target and a battery resistance ERT target~~, each bin further having a ~~predetermined set of charge time measurement set up parameters~~ VI, Vd, and a predetermined ERT charge time limit ~~determined from the battery charge depletion target and the battery resistance ERT target~~.
8. (Canceled)
9. (Original) The system of claim 1, wherein the at least one second device includes a time charge counter for measuring a time in which a relatively constant current charges the capacitor from VI to VF ~~an initial reference voltage (VI) to a physician programmed final voltage (VF)~~.
- 10-25. (Canceled)
26. (Previously Presented) The system of claim 1 wherein the at least one second device includes comparison circuitry, wherein the comparison circuitry includes:
- a first comparator electrically connected to the lithium battery and adapted for comparing a battery terminal voltage (V_{batt}) to a brownout voltage (V_{stop}), the first comparator having a first comparator output;
 - a second comparator electrically connected to the charge storage capacitor and adapted for comparing a storage voltage (V_{cs}) to at least one reference voltage (V_x), the second comparator having a second comparator output, wherein the first comparator output and the second comparator output are adapted to control current

flow from the battery power terminal to the charge storage capacitor.

27. (Currently Amended) The system of claim 26, wherein the at least one second device includes a switched capacitor power supply connected to at least the lithium battery and the charge storage capacitor ~~via a switch~~ for charging the charge storage capacitor.

28. (Previously Presented) The system of claim 27, wherein an output of the comparison circuit is connected to the switched capacitor power supply to control current flow from the battery to the charge storage capacitor.

29. (Currently Amended) A system comprising:
a lithium battery having an internal resistance;
a charge storage capacitor electrically connected to at least the lithium battery;
a first device electrically connected to said lithium battery and adapted to be powered by the battery and to select a discharge voltage (V_d);
at least one second device electrically connected to said charge storage capacitor,
wherein the at least one second device includes:

a comparison circuit, wherein the comparison circuitry includes:

a first comparator electrically connected to the lithium battery and adapted for comparing a battery terminal voltage (V_{batt}) to a brownout voltage (V_{stop}), the first comparator having a first comparator output; and

a second comparator electrically connected to the charge storage capacitor and adapted for comparing a storage voltage (V_{cs}) to at least one reference voltage (V_x), the second comparator having a second comparator output, wherein the first comparator output and the second comparator output are adapted to control current flow from the battery power terminal to the charge storage capacitor, and

a charge time measurement (CTM) control circuit connected to the comparison circuit to perform a charge time measurement, wherein the charge time measurement (CTM) control circuitry is adapted to:

- access a predetermined set of charge time measurement set-up parameters and a predetermined elective replacement time (ERT) charge time limit determined from a battery resistance ERT target that corresponds to a battery charge depletion target;
- determine a rate of charge storage in the capacitor using the predetermined set of charge time measurement set-up parameters,
- compare the determined rate of charge storage in the capacitor to the predetermined ERT charge time limit for the predetermined set of charge time measurement set-up parameters, and
- declare an ERT based on a number of comparisons between the determined rate of charge storage in the capacitor and the ERT charge time limit.

30. (Currently Amended) The system of claim 29, wherein the at least one second device includes a switched capacitor power supply connected to at least the lithium battery and the charge storage capacitor ~~via the discharge switch~~ for charging the charge storage capacitor.

31. (Previously Presented) The system of claim 29, wherein the predetermined set of charge time measurement set-up parameters include:

- a programmed final voltage (VF) to end a time measurement for determining the rate of charge storage in the charge storage capacitor; and

- an initial reference voltage (VI) to begin the time measurement for determining the rate of charge storage in the charge storage capacitor.

32. (Currently Amended) The system of ~~claim 29~~ claim 31, wherein the at least one second device is adapted to increase a voltage (V_{CS}) across the storage capacitor ~~a storage voltage (V_{se})~~ ~~increases~~ approximately linearly from V_I to V_F during the time measurement for determining the rate of charge storage in the charge storage capacitor.

33. (Currently Amended) The system of claim 31, wherein:

the CTM control circuitry includes a multiplexer for selecting one of V_F and V_I to be compared to ~~a charge~~ the storage capacitor voltage level (V_{se}) ~~within the pacemaker control circuitry for controlling (V_{CS}) to control~~ current flow from ~~the~~ a battery power terminal of the battery to the charge storage capacitor; and

the CTM control circuitry is adapted to select V_I to be compared to V_{se} V_{CS} to begin a time charge measurement count and V_F to be compared to V_{se} V_{CS} to end the time charge measurement count.

34. (Previously Presented) The system of claim 31, wherein the CTM control circuitry includes a time charge counter for measuring a time in which a relatively constant current charges the charge storage capacitor from V_I to V_F

35. (Currently Amended) The pacemaker of claim 31, wherein the CTM control circuitry includes a multiplexer for selecting one of the V_F , V_I and V_d to be compared to a ~~the~~ charge storage capacitor voltage level ~~(V_{se})~~ (V_{CS}).

36. (Currently Amended) The ~~pacemaker system~~ system of claim 35, further comprising a bypass capacitor (C_b) connected in parallel across the battery, wherein the CTM control circuitry selects:

V_F to be compared to ~~(V_{se})~~ (V_{CS}) to synchronize the beginning of the time charge measurement;

V_d to be compared to ~~(V_{se})~~ (V_{CS}) to limit the discharge of the charge storage capacitor ~~and open the discharge switch;~~

VI to be compared to ~~(Vse)~~ (V_{CS}) to begin a the time charge measurement ~~count~~ after a ~~bypass capacitor (Cb)~~ Cb is discharged and a battery terminal voltage (V_{batt}) is driven to a brownout voltage (V_{stop}) limit; and

VF to be compared to ~~(Vse)~~ (V_{CS}) to end the time charge measurement ~~count~~.

37. (New) The system of claim 29, wherein the predetermined set of charge time measurement set-up parameters include:

a capacitor discharge voltage (V_d);

an initial reference voltage (VI) to begin the time measurement for determining the rate of charge storage in the capacitor, VI being larger than V_d; and

a physician-programmed final voltage (VF) to end a time measurement for determining the rate of charge storage in the capacitor.

38. (New) The system of claim 37, wherein the charge time measurement (CTM) control circuitry is adapted to determine the rate of charge storage in the capacitor when the capacitor is charged from VI to VF.